	EXHIBIT HALL	EXHIBIT HALL ANNEX
SUNDAY PM	**Symposium Keynote Address** **8:00 – 9:40 PM**	
MONDAY AM	**Latest Advances in Alloy Development I** **8:30 – 10:10 AM** **Latest Advances in Alloy Development II** **11:20 AM – 1:00 PM**	**Interactive Session A:** **Alloy Development** **10:10 – 11:20 AM**
MONDAY PM	**Latest Advances in Processing I** **6:30-7:45 PM** **Latest Advances in Processing II** **8:45 – 10:00 PM**	**Interactive Session B:** **Advances in Processing** **7:45 – 8:45 PM**
TUESDAY AM	**Microdeformation and Macroscopic Properties I** **8:30 – 10:10 AM** **Microdeformation and Macroscopic Properties II** **11:20 AM – 1:00 PM**	**Interactive Session C:** **Physical Metallurgy** **10:10 – 11:20 AM**
WEDNESDAY AM	**Coatings and Environmental Effects I** **8:30 – 10:10 AM** **Coatings and Environmental Effects II** **11:20 AM – 1:00 PM**	**Interactive Session D:** **Coatings, Environmental/Microstructural Degradation** **10:10 – 11:20 AM**
WEDNESDAY PM	**High Temperature Behaviour I** **6:30-7:45 PM** **High Temperature Behaviour II** **8:45 – 10:00 PM**	**Interactive Session E:** **Modelling, Simulation and Validation** **7:45 – 8:45 PM**
THURSDAY AM	**Modeling, Simulation and Validation I** **8:30 – 10:10 AM** **Modeling, Simulation and Validation II** **10:30 AM – 12:10 PM**	

SUNDAY, SEPTEMBER 14, 2008

Symposium Keynote Address

Sunday PM
September 14, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Kenneth Green, Rolls-Royce Corporation; Roger Reed, University of Birmingham

8:00 PM
Opening Remarks by Kenneth Green, Symposium Chair and Roger Reed, Program Chair

8:15 PM
40 Years of Superalloys: Lou Lherbier[1]; [1]Carpenter Technology Corporation

8:30 PM
Keynote Introduction by Roger Reed

8:40 PM Keynote
Challenges for High Temperature Materials in the New Millennium: *Robert Schafrik*[1]; Scott Walston[1]; [1]GE Aviation

Monday, September 15, 2008

Latest Advances in Alloy Development I

Monday AM
September 15, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Roger Reed, University of Birmingham; Mike Goulette, Rolls-Royce plc

8:30 AM
NASA and Superalloys: A Customer, a Participant, and a Referee: *Michael Nathal*[1]; [1]NASA Glenn Research Center

8:55 AM
Development of a New Fatigue and Creep Resistant PM Nickel-Base Superalloy for Disk Applications: *Jean-Yves Guedou*[1]; Isabelle Augustins-Lecallier[2]; Loïc Nazé[2]; Pierre Caron[3]; Didier Locq[3]; [1]Société Nationale d'Etudes et Construction de Moteurs d'Aviation; [2]Ecole des Mines de Paris; [3]Office National d'Etudes et Recherches Aérospatiales

9:20 AM
A New Ni-Base Superalloy for Oil and Gas Applications: *Sarwan Mannan*[1]; Lesh Patel[1]; [1]Special Metals Corporation

9:45 AM
Structure Control of a New-Type High-Cr Superalloy: *Jianxin Dong*[1]; Zhongnan Bi[1]; Ning Wang[2]; Xishan Xie[1]; Zhigang Wang[3]; [1]University of Science and Technology Beijing; [2]Special Steel Branch, Baoshan Iron and Steel Company, Ltd.; [3]Northeast Special Steel Group Company, Ltd.

Interactive Session A: Alloy Development

Monday, 10:10-11:20 AM
September 15, 2008

Room: Exhibit Hall Annex
Location: Seven Springs Mountain Resort

A1, Development of Ni-Co-Base Alloys for High-Temperature Disk Applications: *Yuefeng Gu*[1]; C. Cui[1]; H. Harada[1]; T. Fukuda[1]; D. Ping[1]; A. Mitsuhashi[2]; K. Kato[2]; T. Kobayashi[1]; J. Fujioka[1]; [1]National Institute for Materials Science; [2]Mitsubishi Materials Corporation

A2, The Microstructure and Mechanical Properties of EP741NP Powder Metallurgy Disc Material: *John Radavich*[1]; David Furrer[2]; Tadeu Carneiro[3]; Joeseph Lemsky[4]; [1]Micro-Met Laboratories, Inc.; [2]Rolls-Royce Corporation; [3]Companhia Brasileira de Metalurgia e Mineração; [4]Ladish Company, Inc.

A3, Effects of a Tantalum Addition on the Morphological and Compositional Evolution of a Model Ni-Al-Cr Superalloy: *Christopher Booth-Morrison*[1]; Ronald Noebe[2]; David Seidman[1]; [1]Northwestern University; [2]NASA Glenn Research Center

A4, Linking the Properties, Processing Chemistry of Advanced Single Crystal Ni-Base Superalloys: *Sammy Tin*[1]; Lijuan Zhang[2]; Robbie Hobbs[3]; An-Chou Yeh[2]; Catherine Rae[2]; Robert Broomfield[3]; [1]Illinois Institute of Technology; [2]University of Cambridge; [3]Rolls Royce plc

A5, Effect of Ruthenium on Microstructure and Stress Rupture Properties of a Single Crystal Nickel-Base Superalloy: *Yafang Han*[1]; W. Ma[2]; Z. Dong[2]; Shusuo Li[2]; S. Gong[2]; [1]Beijing Institute of Aeronautical Materials; [2]Beijing University of Aeronautics and Astronautics

A6, Optimizing SC René N4 Alloy for DS Aft-Stage Bucket Applications in Industrial Gas Turbines: *Greg Bouse*[1]; Jon Schaeffer[1]; M. F. Henry[2]; [1]General Electric Energy; [2]GE Global Research Center

A7, The Influence of Ruthenium and Rhenium on the Local Properties of the γ- and γ'-Phase in Nickel-Base Superalloys and Their Consequences for Alloy Behavior: *Steffen Neumeier*[1]; Florian Pyczak[1]; Mathias Göken[1]; [1]University of Erlangen-Nuremberg

A8, The Effects of Heat Treatment and Microstructure Variations on Disk Superalloy Properties at High Temperature: *Timothy Gabb*[1]; John Gayda[1]; Jack Telesman[1]; Anita Garg[2]; [1]NASA Glenn Research Center; [2]University of Toledo/NASA Glenn Research Center

A9, A 5th Generation SC Superalloy with Balanced High Temperature Properties and Processability: *Akihiro Sato*[1]; Hiroshi Harada[1]; An-Chou Yeh[1]; Kyoko Kawagishi[1]; Toshiharu Kobayashi[1]; Yutaka Koizumi[1]; Tadaharu Yokokawa[1]; Jian-Xin Zhang[1]; [1]National Institute for Materials Science

A10, P/M Alloy 10 – A 700ºC Capable Nickel-Based Superalloy for Turbine Disk Applications: *Derek Rice*[1]; Pete Kantzos[1]; Brian Hann[1]; James Neumann[1]; Randolph Helmink[2]; [1]Honeywell International Inc; [2]Rolls-Royce North America Technologies, Inc.

A11, The Effect of Composition, Misfit, and Heat Treatment on the Primary Creep Behavior of Single Crystal Nickel Base Superalloys PWA 1480 and PWA 1484: *Brandon Wilson*[1]; Gerhard Fuchs[1]; [1]University of Florida

A12, Influence of the γ' Fraction on the γ/γ' Topological Inversion during High Temperature Creep of Single Crystal Superalloys: *Pierre Caron*[1]; Catherine Ramusat[1]; Frédéric Diologent[2]; [1]Office National d'Etudes et Recherches Aérospatiales; [2]Ecole Polytechnique Fédérale de Lausanne

Latest Advances in Alloy Development II

Monday AM
September 15, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Mike Goulette, Rolls-Royce plc; Roger Reed, University of Birmingham

11:20 AM
Evaluation of Ruthenium-Bearing Single Crystal Superalloys - A Design of Experiments: *Robbie Hobbs*[1]; Gyaneshwara Brewster[2]; Catherine Rae[2]; Sammy Tin[3]; [1]Rolls-Royce plc; [2]University of Cambridge; [3]Illinois Institute of Technology

11:45 AM
Development of High Temperature Capability P/M Disk Superalloys: *Eric Huron*[1]; Kenneth Bain[1]; David Mourer[1]; Timothy Gabb[2]; [1]GE Aircraft Engines; [2]NASA Glenn Research Center

12:10 PM
Development of a Fabricable Gamma-Prime (γ') Strengthened Superalloy: *Lee Pike*[1]; [1]Haynes International Inc

12:35 PM
Elevated Temperature Mechanical Behavior of New Low CTE Superalloys: *Christopher Cowen*[1]; Paul Jablonski[1]; [1]National Energy Technology Laboratory

Latest Advances in Processing I

Monday PM
September 15, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Timothy Gabb, NASA Glenn Research Center; David Mourer, GE Aviation

6:30 PM
New Boron and Silicon Free Single Crystal-Diffusion Brazing Alloys: Markus Dinkel[1]; Paul Heinz[1]; Florian Pyczak[1]; Andreas Volek[2]; Michael Ott[3]; Ernst Affeldt[4]; Andreas Vossberg[5]; Mathias Göken[1]; *Robert Singer*[1]; [1]University Erlangen - Nürnberg; [2]University Erlangen - Nürnberg/Now at Diehl Stiftung § Company KG; [3]Siemens AG Power Generation; [4]Motoren un Turbinen Union Aero Engines; [5]Motoren un Turbinen Union Maintenance GmbH

6:55 PM
Creep-Fatigue and Thermo-Mechanical Fatigue of Friction-Welded IN718/MarM247 Dissimilar Joint: *Masakazu Okazaki*[1]; Motoki Sakaguchi[1]; T. Tran[1]; Masaru Sekihara[1]; [1]Nagaoka University of Technology

7:20 PM
Gas Turbine Blade Made of FG75-Investment Casting Technology for Complex, Hollow, Fibre-Reinforced NiAl-Components: *Simon Hollad*[1]; Christof Dahmen[1]; Andreas Bührig-Polaczek[1]; [1]Foundry Institut of RWTH Aachen University

Interactive Session B: Advances in Processing

Monday, 7:45-8:45 PM
September 15, 2008

Room: Exhibit Hall Annex
Location: Seven Springs Mountain Resort

B1, A Study of Haz Microfissuring in a Newly Developed Allvac® 718 Plus™ Superalloy: Krutika Vishwakarma[1]; *Mahesh Chaturvedi*[1]; [1]University of Manitoba

B2, Advancements in Fast Epitaxial High Temperature Brazing of Single Crystalline Nickel Based Superalloys: *Britta Laux*[1]; S. Piegert[1]; J. Rösler[1]; [1]Technische Universität Braunschweig

B3, An Analysis of Solidification Path in the Ni-Base Superalloy, CMSX10K: Neil D'Souza[1]; *Hongbiao Dong*[2]; [1]Rolls-Royce plc; [2]University of Leicester

B4, Post-Fabrication Vapor Phase Strengthening of a Nickel-Based Sheet Alloy for Thermostructural Panels: *Sara Johnson*[1]; Raghavendra Adharapurapu[1]; Tresa Pollock[1]; [1]University of Michigan

B5, Solute Redistribution during Planar and Dendritic Growth of Directionally Solidified Ni-Base Superalloy CMSX-10: *Seong Moon Seo*[1]; Je-Hyun Lee[2]; Young-Soo Yoo[1]; Chang-Yong Jo[1]; Hirofumi Miyahara[3]; Keisaku Ogi[4]; [1]Korea Institute of Materials Science; [2]Changwon National University; [3]Kyushu University; [4]Oita National College of Technology

B6, The Effects of Withdrawal and Melt Overheating Histories on the Microstructure of a Nickel-Based Single Crystal Superalloy: *Lin Liu*[1]; Taiwen Hang[1]; Minming Zou[1]; Weiguo Zhang[1]; Jun Zhang[1]; Hengzhi Fu[1]; [1]Northwestern Polytechnical University

B7, Influence of TLP Bonding on Creep Deformation of a Nickel-Base Single Crystal Superalloy at High Temperature: *Jide Liu*[1]; Tao Jin[1]; Nairen Zhao[1]; Zhihui Wang[1]; Xiaofeng Wang[1]; Xiaofeng Sun[1]; Hengrong Guan[1]; Zhuang-qi Hu[1]; [1]Chinese Academy of Sciences, Institute of Metal Research

B8, Design of Solutionizing Heat Treatments for an Experimental Single Crystal Superalloy: *Subray Hegde*[1]; Rick Kearsey[2]; Jonathan Beddoes[1]; [1]Carleton University; [2]National Research Council

B9, Effect of Cooling Rate on Gleeble Hot Ductility of UDIMET Alloy 720 Billet: *Michael Fahrmann*[1]; Akane Suzuki[2]; [1]Special Metals Corporation; [2]GE Global Research (previously University of Michigan)

B10, Competitive Grain Growth in Directional Solidification of a Nickel-Base Superalloy: *Yizhou Zhou*[1]; Nicholas Green[1]; [1]University of Birmingham

B11, Severe Thermomechanical Processing as an Effective Method for the Preparation of Bulk and Sheet Nanostructured Semifinished Products from Nickel Alloys 718 and 718Plus: *Vener Valitov*[1]; Radik Mulyukov[1]; Michael Gigliotti[2]; P.R. Subramanian[2]; [1]Institute for Metals Superplasticity Problems, Russian Academy of Sciences; [2]General Electric Global Research

B12, Investigation of the Partition Coefficient in the Ni-Fe-Nb Alloys: A Thermodynamic and Experimental Approach: *Jairo Valdes*[1]; Shun-Li Shang[1]; Dongeung Kim[2]; DongEung Kim[2]; Paul King[3]; Zi-Kui Liu[2]; Xingbo Liu[1]; [1]West Virginia University; [2]Pennsylvania State University; [3]National Energy Technology Laboratory

B13, Effect of Thermal History on the Properties and Microstructure of a Large HIPed PM Superalloy Billet: *David Novotnak*[1]; Gernant Maurer[2]; Louis Lherbier[2]; John Radavich[3]; [1]Carpenter Powder Products; [2]Carpenter Technology Corporation; [3]MicroMet Laboratories Inc.

Latest Advances in Processing II

Monday PM
September 15, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: David Mourer, GE Aviation; Timothy Gabb, NASA Glenn Research Center

8:45 PM
Process Development and Microstructure and Mechanical Property Evaluation of a Dual Microstructure Heat Treated Advanced Nickel Disc Alloy: *Rob Mitchell*[1]; Joe Lemsky[2]; Ranga Ramanathan[2]; Hangyue Li[3]; Karen Perkins[4]; Leigh Connor[5]; [1]Rolls-Royce plc; [2]Ladish Company, Inc.; [3]University of Birmingham; [4]University of Wales, Swansea; [5]University of Cambridge

9:10 PM
A Statistical Analysis of Variations in Hot Tear Performance and Microporosity Formation versus Composition in Investment Cast FSX-414: *Kevin Ronan*[1]; [1]PCC Structurals Inc.

9:35 PM
Grain Selection during Solidification in Spiral Grain Selector: *Huijuan Dai*[1]; Jean-Christophe Gebelin[2]; Matthew Newell[2]; Roger Reed[2]; Neil D'Souza[3]; Paul Brown[3]; Hongbiao Dong[1]; [1]University of Leicester; [2]University of Birmingham; [3]Rolls-Royce plc

Tuesday, September 16, 2008

Microdeformation and Macroscopic Properties I

Tuesday AM
September 16, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Eric Huron, GE Aircraft Engines; Jean-Yves Guedou, SNECMA

8:30 AM
Deformation Mechanisms in Ni-Base Disk Superalloys at Higher Temperatures: *Raymond Unocic*[1]; Libor Kovarik[1]; Chen Shen[1]; Peter Sarosi[1]; Yunzhi Wang[1]; Ju Li[1]; Somnath Ghosh[1]; Michael Mills[1]; [1]Ohio State University

8:55 AM
Grain Boundary and Intragranular Deformations during High Temperature Creep of a PM Nickel-Based Superalloy: *Aurélie Soula*[1]; Yves Renollet[1]; Denis Boivin[1]; Jean Louis Pouchou[1]; Didier Locq[1]; Pierre Caron[1]; Yves Bréchet[2]; [1]Office National d'Etudes et Recherches Aérospatiales; [2]Laboratoire de Thermodynamique et Physicochimie Metallurgiques/Grenoble Polytechnic Institute

9:20 AM
Grain Scale Straining Processes during High Temperature Compression of a PM Disk Alloy: *Wen Tu*[1]; Tresa Pollock[1]; [1]University of Michigan

9:45 AM
The Effect of γ' Particle Size on the Deformation Mechanism in an Advanced Polycrystalline Nickel-Base Superalloy: *Michael Preuss*[1]; Joao Quinta da Fonseca[1]; Mark Daymond[2]; Benedict Grant[1]; Elisabeth Knoche[1]; Richard Moat[1]; [1]University of Manchester; [2]Queens University

Interactive Session C: Physical Metallurgy

Tuesday, 10:10-11:20 AM
September 16, 2008

Room: Exhibit Hall Annex
Location: Seven Springs Mountain Resort

C1, Surface Effects on Low Cycle Fatigue Behavior in IN718 Alloy: *Prabir Bhowal*[1]; Darryl Stolz[1]; Agnieszka Wusatowska-Sarnek[1]; Rick Montero[1]; [1]Pratt & Whitney

C2, The Characterisation and Prediction of LCF Behaviour in Nickel Single Crystal Blade Alloys: *William Evans*[1]; Robert Lancaster[1]; Adam Steele[1]; Neil Jones[1]; [1]Swansea University

C3, Tension/Compression Asymmetry in Yield and Creep Strengths of Ni-Based Superalloys: *Nobuyasu Tsuno*[1]; Shunsuke Shimabayashi[1]; Koji Kakehi[1]; Catherine Rae[2]; Roger Reed[3]; [1]Tokyo Metropolitan University, Department of Mechanical Engineering; [2]University of Cambridge; [3]University of Birmingham

C4, Effects of Low Angle Boundaries on the Mechanical Properties of Single Crystal Superalloy DD6: *Jia Rong Li*[1]; J. Q. Zhao[1]; S. Z. Liu[1]; M. Han[1]; [1]Beijing Institute of Aeronautical Materials

C5, High Temperature Creep of Directionally Solidified Ni Base Superalloys Containing Local Recrystallization: Guang Xie[1]; Li Wang[1]; *Jian Zhang*[1]; Lang Hong Lou[1]; [1]Institute of Metal Research

C6, The Effect of Thermomechanical Processing on the Microstructure and Creep Behavior of Udimet Alloy 188: *Sara Longanbach*[1]; Carl Boehlert[1]; [1]Michigan State University

C7, Failure Analysis of Weld-Repaired B-1900 Turbine Blade Shrouds: *Erik Mueller*[1]; Luis Carney[1]; Sun Ngin[1]; John Yadon[1]; [1]Naval Air Systems Command

C8, High Temperature Microstructural Degradation of Haynes Alloy 230: Jana Veverkova[1]; Andrew Strang[1]; Geoffrey Marchant[2]; Helen Atkinson[1]; Gordon McColvin[2]; [1]University of Leicester; [2]Siemens Industrial Turbomachinery, Ltd.

C9, The Effect of Carbide Morphologies on Elevated Temperature Tensile and Fatigue Behavior of a Modified Single Crystal Ni-Base Superalloy: *Andrew Wasson*[1]; Gerhard Fuchs[1]; [1]University of Florida

C10, Gamma Prime Morphology and Creep Properties of Nickel Base Superalloys with Platinum Group Metal Additions: *Jason Van Sluytman*[1]; A. Suzuki[1]; Ann Bolcavage[2]; Randolph Helmink[2]; Donna Ballard[3]; T. Pollock[1]; [1]University of Michigan; [2]Rolls Royce North American Technologies, Inc.; [3]Air Force Research Laboratory

C11, Elevated-Temperature Creep-Fatigue Crack-Growth Behavior of Nickel-Based HAYNES® R-41, HAYNES® 230® and HASTELLOY® X Alloys: *Soo Yeol Lee*[1]; Peter Liaw[1]; Yulin Lu[1]; Douglas Fielden[1]; Lee Pike[2]; Dwaine Klarstrom[2]; [1]University of Tennessee; [2]Haynes International, Inc.

C12, A New Hyperbolic Tangent Modelling Approach for the Creep Behaviour of the Single Crystal Nickel-Based Superalloy CMSX4: *Hector Basoalto*[1]; Bernd Vermeulen[1]; Jeffery Brooks[1]; Gina Coventry[2]; Steve Williams[2]; Julian Mason-Flucke[2]; Stephen Bagnall[2]; [1]QinetiQ Ltd.; [2]Rolls-Royce plc

C13, Assessment on the Thermo-Mechanical Fatigue Properties of 98 Ni-Base Single Crystal Superalloys: *Masao Sakamoto*[1]; Hiroshi Harada[1]; T. Yokokawa[1]; Y. Koizumi[1]; T. Kobayashi[1]; H. Zhou[2]; J.X. Zhang[3]; N. Miyamoto[4]; [1]National Institute for Materials Science; [2]Formerly of National Institute for Materials Science, Presently at University of Queensland; [3]Formerly of National Institute for Materials Science, Presently at Shandong University; [4]Formerly of National Institute for Materials Science, Presently at Kiguchi Technics Inc

C14, Comparison of Low Cycle (Notch) Fatigue Behaviour at Temperature in Single Crystal Turbine Blade Materials: *Philippa Reed*[1]; Mark Miller[1]; [1]University of Southampton

C15, Fatigue Behavior in Monocrystalline Ni-Based Superalloys for Blade Applications: *Clarissa Yablinsky*[1]; Katharine Flores[1]; Michael Mills[1]; James Williams[1]; Joseph Rigney[2]; [1]Ohio State University; [2]GE Aviation

C16, Microstructural Conditions Contributing to Fatigue Variability in P/M Nickel-Base Superalloys: *William Porter*[1]; Kezhong Li[1]; Michael Caton[2]; Sushant Jha[3]; Bence Bartha[3]; James Larsen[2]; [1]University of Dayton Research Institute; [2]Air Force Research Laboratory; [3]Universal Technology Corporation

C17, A TEM Investigation on Precipitation Behavior of AEREX350 Superalloy: *Mojtaba Samiee*[1]; Sirous Asgari[1]; [1]Sharif University of Technology

C18, Elastic Microstrains during Tension and Creep of Superalloys: Results from In Situ Neutron Diffraction: Y. Lu[1]; S. Ma[2]; *Bhaskar Majumdar*[3]; [1]Rice University; [2]University of Michigan; [3]New Mexico Tech

Microdeformation and Macroscopic Properties II

Tuesday AM
September 16, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Jean-Yves Guedou, SNECMA; Eric Huron, GE Aircraft Engines

11:20 AM
Mean vs. Life-Limiting Fatigue Behavior of a Nickel-Based Superalloy: *Sushant Jha*[1]; Michael Caton[2]; James Larsen[2]; [1]Universal Technology Corporation; [2]US Air Force Research Laboratory

11:45 AM
Assessment of Lifetime Calculation of Forged IN718 Aerospace Components Based on a Multi-Parametric Microstructural Evaluation: *Michael Stoschka*[1]; Martin Stockinger[2]; Heinz Leitner[1]; Wilfried Eichlseder[1]; Martin Riedler[2]; [1]University of Leoben; [2]Böhler Schmiedetechnik GmbH and Company KG

12:10 PM
Evaluation of the Influence of Grain Structure on the Fatigue Variability of Waspaloy: Mandy Brogdon[1]; *Andrew Rosenberger*[2]; [1]University of Dayton Research Institute; [2]US Air Force

12:35 PM
Fatigue Crack Initiation in Nickel-Based Superalloy René 88 DT at 593°C: *Jiashi Miao*[1]; T.M. Pollock[1]; J. Wayne Jones[1]; [1]University of Michigan, Ann Arbor

Wednesday, September 17, 2008

Coatings and Environmental Effects I

Wednesday AM
September 17, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Pierre Caron, Office National d'Etudes et Recherches Aérospatiales; Tresa Pollock, University of Michigan

8:30 AM
Superalloys for Ultra Supercritical Steam Turbines—Oxidation Behavior: *Gordon Holcomb*[1]; [1]US Department of Energy

8:55 AM
Effects of Oxidation and Hot Corrosion in a Nickel Disc Alloy: *Mark Hardy*[1]; John Nicholls[2]; Nigel Simms[2]; Adriana Encinas-Oropesa[2]; Gemma Drew[1]; Jonathan Leggett[1]; [1]Rolls-Royce plc; [2]Cranfield University

9:20 AM
Development of Si-Bearing 4th Generation Ni-Base Single Crystal Superalloys: *An-Chou Yeh*[1]; Kyoko Kawagishi[1]; Hiroshi Harada[1]; Tadaharu Yokokawa[1]; Toshiharu Kobayashi[1]; Yutaka Koizumi[1]; De-Hai Ping[1]; Junzo Fujioka[1]; T. Suzuki[1]; [1]National Institute for Materials Science (NIMS)

9:45 AM
The Development and Performance of Novel Pt+Hf-Modified γ'-Ni_3Al+γ-Ni Bond Coatings for Advanced Thermal Barrier Coatings Systems: Nan Mu[1]; T. Izumi[2]; Liming Zhang[3]; *Brian Gleeson*[1]; [1]Iowa State University – and - University of Pittsburgh; [2]Iowa State University – and – Hokkaido University; [3]Iowa State University – and – GE Aviation

Interactive Session D: Coatings, Environmental/Microstructural Degradation

Wednesday, 10:10-11:20 AM
September 17, 2008

Room: Exhibit Hall Annex
Location: Seven Springs Mountain Resort

D1, The Performance of Pt-Modified Alumina-Forming Coatings and Model Alloys: *Bruce Pint*[1]; J. Haynes[1]; Karren More[1]; Joachim Schneibel[1]; Ying Zhang[2]; Ian Wright[1]; [1]Oak Ridge National Laboratory; [2]Tennessee Tech University

D2, Oxidation of MCrAlY Coatings on Ni-Based Superalloys: *Michael Pace*[1]; Rachel Thomson[1]; J. Wells[2]; [1]Loughborough University; [2]RWE npower plc

D3, Oxidation and Coating Evolution in Aluminized Fourth Generation Blade Alloys: *Ian Edmonds*[1]; Hugh Evans[1]; C. Jones[2]; [1]University of Birmingham; [2]Rolls-Royce plc

D4, Formation of γ'-Ni3Al via the Peritectiod Reaction: $\gamma + \beta$ (+ Al_2O_3) = γ' (+ Al_2O_3): *Evan Copland*[1]; [1]NASA

D5, Analysis of Surface Chemical Contamination on Ex-Service Industrial Gas Turbine Components: *Steven Feng*[1]; Barbara Shollock[1]; Roger Reed[2]; Mary Ryan[1]; [1]Imperial College London; [2]University of Birmingham

D6, Long-Term Cyclic-Oxidation Behavior of Selected High Temperature Alloys: *Vinay Deodeshmukh*[1]; S. Srivastava[1]; [1]Haynes International

D7, High Temperature Corrosion Behavior of DS GTD-111 in Oxidizing and Sulfidizing Environments: *Matthew Trexler*[1]; Thomas Sanders[1]; Preet Singh[1]; [1]Georgia Institute of Technology

D8, The Influence of Hot-Deformation Parameters on the Mechanical Properties and Precipitation Process in Nickel Based Superalloy: *Andrzej Nowotnik*[1]; [1]Rzeszow University of Technology

D9, Creep Behavior of Thick and Thin Walled Structures of a Single Crystal Nickel-Base Superalloy at High Temperatures – Experimental Method and Results: Rainer Hüttner[1]; Rainer Völkl[1]; Johannes Gabel[1]; *Uwe Glatzel*[1]; [1]University Bayreuth

D10, Microstructural Degradation of CMSX-4: Kinetics and Effect on Mechanical Properties: *Alexander Epishin*[1]; Thomas Link[1]; Mohamed Nazmy[2]; Marc Staubli[2]; H. Klingelhöffer[3]; Gert Nolze[3]; [1]Technical University Berlin; [2]ALSTOM Ltd.; [3]Federal Institute for Materials Research and Testing

D11, Long Term Coarsening of René 80 Ni-Base Superalloy: *Despina Hadjiapostolidou*[1]; Barbara Shollock[1]; [1]Imperial College London

D12, Temperature and Dwell Dependence of Fatigue Crack Propagation in Various Heat Treated Turbine Disc Alloys: *Stewart Everitt*[1]; Marco Starink[1]; Philippa Reed[1]; [1]University of Southampton

Coatings and Environmental Effects II

Wednesday AM
September 17, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Tresa Pollock, University of Michigan; Pierre Caron, Office National d'Etudes et Recherches Aérospatiales

11:20 AM
Development of Improved Bond Coat for Enhanced Turbine Durability: *Brian Hazel*[1]; Joe Rigney[1]; Mark Gorman[1]; Brett Boutwell[1]; Ram Darolia[1]; [1]General Electric

11:45 AM
EQ Coating: A New Concept for SRZ-Free Coating Systems: *Kyoko Kawagishi*[1]; Hiroshi Harada[1]; Akihiro Sato[2]; Kazuhide Matsumoto[1]; [1]National Institute for Materials Science; [2]Ishikawajima-Harima Heavy Industries Company, Ltd.

12:10 PM
An Investigation of the Compatibility of Nickel-Based Single Crystal Superalloys with Thermal Barrier Coating Systems: *Rudder Wu*[1]; Kyoko Kawagishi[2]; Hiroshi Harada[2]; Roger Reed[3]; [1]Imperial College; [2]National Institute for Materials Science; [3]University of Birmingham

12:35 PM
Secondary Reaction Zones in Coated 4th Generation Ni-Based Blade Alloys: *Aya Suzuki*[1]; Catherine Rae[1]; M. Yoshida[2]; Y. Matsubara[2]; H. Murakami[2]; [1]University of Cambridge; [2]National Research Institute for Materials Science

High Temperature Behavior I

Wednesday PM
September 17, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Shiela Woodard, Pratt & Whitney; Olaf Roder, MTU Aero Engines GmbH

6:30 PM
Thermal Stability Characterization of Ni-Base ATI 718Plus® Superalloy: *Wei-Di Cao*[1]; [1]ATI Allvac

6:55 PM
The Precipitation and Strengthening Behavior of Ni2(Mo,Cr) in HASTELLOY® C-22HS® Alloy, A Newly Developed High Molybdenum Ni-Base Superalloy: *Xishan Xie*[1]; Yanping Zeng[1]; Lizhong Kou[1]; Jianxin Dong[1]; Lee Pike[2]; Dwaine Klarstrom[2]; [1]University of Science and Technology, Beijing; [2]Haynes International Inc

7:20 PM
Effect of Microstructure on Time Dependent Fatigue Crack Growth Behavior in a P/M Turbine Disk Alloy: *Jack Telesman*[1]; Timothy Gabb[1]; Anita Garg[2]; Pete Bonacuse[3]; J. Gayda[1]; [1]NASA Glenn Research Center; [2]NASA Glenn/University of Toledo; [3]U.S. Army Research Laboratory

Interactive Session E: Modelling, Simulation and Validation

Wednesday, 7:45-8:45 PM
September 17, 2008

Room: Exhibit Hall Annex
Location: Seven Springs Mountain Resort

E1, Phase-Field Modeling of γ' Precipitation in Multi-Component Ni-Base Superalloys: *Tomonori Kitashima*[1]; De-Hai Ping[1]; Jincheng Wang[2]; Hiroshi Harada[1]; [1]Natinal Institute for Materials Science, Japan; [2]Northwestern Polytechnical University, China

E2, Evolution of Size and Morphology of γ' Precipitates in UDIMET 720 Li during Continuous Cooling: *Rene Radis*[1]; M. Schaffer[1]; M. Albu[1]; G. Kothleitner[1]; P. Pölt[1]; Ernst Kozeschnik[1]; [1]Graz University of Technology

E3, Quantitative Characterization of Features Affecting Crack Path in a Directionally Solidified Superalloy: *Matthew Trexler*[1]; Thomas Sanders Jr[1]; [1]Georgia Institute of Technology

E4, Modeling Topologically Close-Packed Phases in Superalloys: Valence-Dependent Bond-Order Potentials Based on Ab-Initio Calculations: *Thomas Hammerschmidt*[1]; B. Seiser[1]; Ralf Drautz[1]; David Pettifor[1]; [1]University of Oxford

E5, Microstructure Modeling of the Dynamic Recrystallization Kinetics during Turbine Disc Forging of the Nickel Based Superalloy Allvac 718 Plus™: *Daniel Huber*[1]; Christof Sommitsch[1]; Stefan Mitsche[2]; Peter Poelt[2]; Bruno Buchmayr[1]; Martin Stockinger[3]; C. Stotter[1]; [1]University of Leoben; [2]Institute for Electron Microscopy; [3]Böhler Schmiedetechnik GmbH and Company KG

E6, High Temperature Nanoindentation of Ni-Base Superalloys: Amol Sawant[1]; *Sammy Tin*[1]; J.-C. Zhao[2]; [1]Illinois Institute of Technology; [2]GE Global Research

E7, A New Analytical Method of γ/γ' Morphology in Single Crystal Ni-Base Superalloys: For New Orientation of Damage and Remaining Life Assessment: *Motoki Sakaguchi*[1]; Masakazu Okazaki[1]; [1]Nagaoka University of Technology

E8, Characterization of Three-Dimensional Dendritic Structures in Nickel-Base Single Crystals for Investigation of Defect Formation: *Jonathan Madison*[1]; Jonathan Spowart[2]; David Rowenhorst[3]; Jane Fiedler[1]; Tresa Pollock[1]; [1]University of Michigan; [2]US Air Force; [3]Naval Research Laboratory

High Temperature Behavior II

Wednesday PM
September 17, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Olaf Roder, MTU Aero Engines GmbH; Shiela Woodard, Pratt & Whitney

8:45 PM
Atom Probe Tomography Analysis of Possible Rhenium Clustering in Nickel-Based Superalloys: *Alessandro Mottura*[1]; Michael Miller[2]; Roger Reed[3]; [1]Imperial College London; [2]Oak Ridge National Laboratory; [3]University of Birmingham

9:10 PM
Designing of High-Rhemium Single Cristal Ni-Based Supealloy for Gas Turbine Blades: *Eugeny Kablov*[1]; N.V. Petrushin[1]; [1]FSUE "Vserossiysky Research Institute of Aircraft Material"

9:35 PM
Numerical Modelling of Creep Deformation in a CMSX-4 Single Crystal Superalloy Turbine Blade: *David Dye*[1]; Anxin Ma[1]; Roger Reed[2]; [1]Imperial College; [2]University of Birmingham

Thursday, September 18, 2008

Modeling, Simulation and Validation I

Thursday AM
September 18, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: Michael Fahrmann, Special Metals Corporation; David Furrer, Rolls-Royce Corporation

8:30 AM
Precipitation Model Validation in 3rd Generation Aeroturbine Disc Alloys: *Gregory Olson*[1]; Herng-Jeng Jou[1]; Jin-Won Jung[1]; Jason Sebastian[1]; A. Misra[1]; Ivan Locci[2]; D. Hull; [1]QuesTek Innovations LLC; [2]NASA Glenn Research Center

8:55 AM
A Modeling Tool for the Precipitation Simulations of Superalloys during Heat Treatments: *Kaisheng Wu*[1]; Fan Zhang[1]; Shuanglin Chen[1]; Weisheng Cao[1]; Y. Chang[2]; [1]CompuTherm LLC; [2]University of Wisconsin-Madison

9:20 AM
Non-Isothermal Creep Behavior of a Second Generation Ni-Based Single Crystal Superalloy: Experimental Characterization and Modeling: *Jonathan Cormier*[1]; Xavier Milhet[1]; François Vogel[2]; José Mendez[1]; [1]Ecole Nationale Supérieure de Mécanique et d'Aérotechnique/Laboratoire de Mécanique et de Physique des Matériaux; [2]Turboméca – SAFRAN Group

9:45 AM
Development of a Simulation Approach to Microstructure Evolution during Solidification and Homogenisation Using the Phase Field Method: *Nils Warnken*[1]; Anne Drevermann[2]; Dexin Ma[3]; Suzana Fries[4]; Ingo Steinbach[2]; [1]University of Birmingham; [2]ACCESS e.V.; [3]Foundry Institute of the RWTH Aachen; [4]SGM Scientific Consulting

10:10 AM Break

Modeling, Simulation and Validation II

Thursday AM
September 18, 2008

Room: Exhibit Hall
Location: Seven Springs Mountain Resort

Session Chairs: David Furrer, Rolls-Royce Corporation; Michael Fahrmann, Special Metals Corporation

10:30 AM
A Coupled Creep Plasticity Model for Residual Stress Relaxation of a Shot Peened Nickel-Base Superalloy: *Dennis Buchanan*[1]; Reji John[2]; Robert Brockman[1]; Andrew Rosenberger[2]; [1]University of Dayton Research Institute; [2]Air Force Research Laboratory

10:55 AM
Integration of Simulations and Experiments for Modeling Superalloy Grain Growth: *Eric Payton*[1]; Gang Wang[1]; Ning Ma[1]; Yunzhi Wang[1]; Michael Mills[1]; David Mourer[2]; Deborah Whitis[2]; Dan Wei[2]; [1]Ohio State University; [2]GE Aviation

11:20 AM
Polycrystalline Modelling of Udimet 720 Forging: *Julien Thebault*[1]; Colette Rey[1]; Michel Clavel[1]; Thierry Baudin[2]; Denis Solas[2]; Olivier Fandeur[3]; [1]Ecole Centrale Paris, Laboratoire MSSM; [2]University Paris Sud, Institut de Chimie Moléculaire et des Matériaux d'Orsay, Laboratoire de Physico Chimie de l'Etat Solide; [3]Commissariat Energie Atomique, Saclay

11:45 AM
Studies on Alloying Element Partitioning in DMS4 Nickel Base Superalloy Using Monte Carlo Simulations and 3D Atom Probe: *R. Balamuralikrishnan*[1]; R. Sankarasubramanian[1]; Mohan Pathak[1]; K. Muraleedharan[1]; N. Das[1]; [1]Defence Metallurgical Research Laboratory

12:10 PM
Adjourn Symposium

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